UFOP Information on Paradigm Shift in Biofuel Policies:

From volume quotas to a greenhouse gas avoidance quota and the effects on biofuels

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Paradigm shift in biofuels policy:

From a quota system to GHG reduction requirements and the impact on biofuels

Since biofuels have been criticised increasingly in the recent past, current proposals for the reorientation of biofuels policy at German and European levels require sustainability certification of biofuels.[1] In addition to the assurance of sustainable biomass production for bioenergy, reduction of GHG is also highly emphasized. The tendency is to no longer set mere volume or energetic quotas for the use of biofuels. It rather becomes apparent that in future policies GHG saving targets or at least a minimum percentage of GHG savings for biofuels, which can be accounted for within the quota system or tax promotion will dominate.

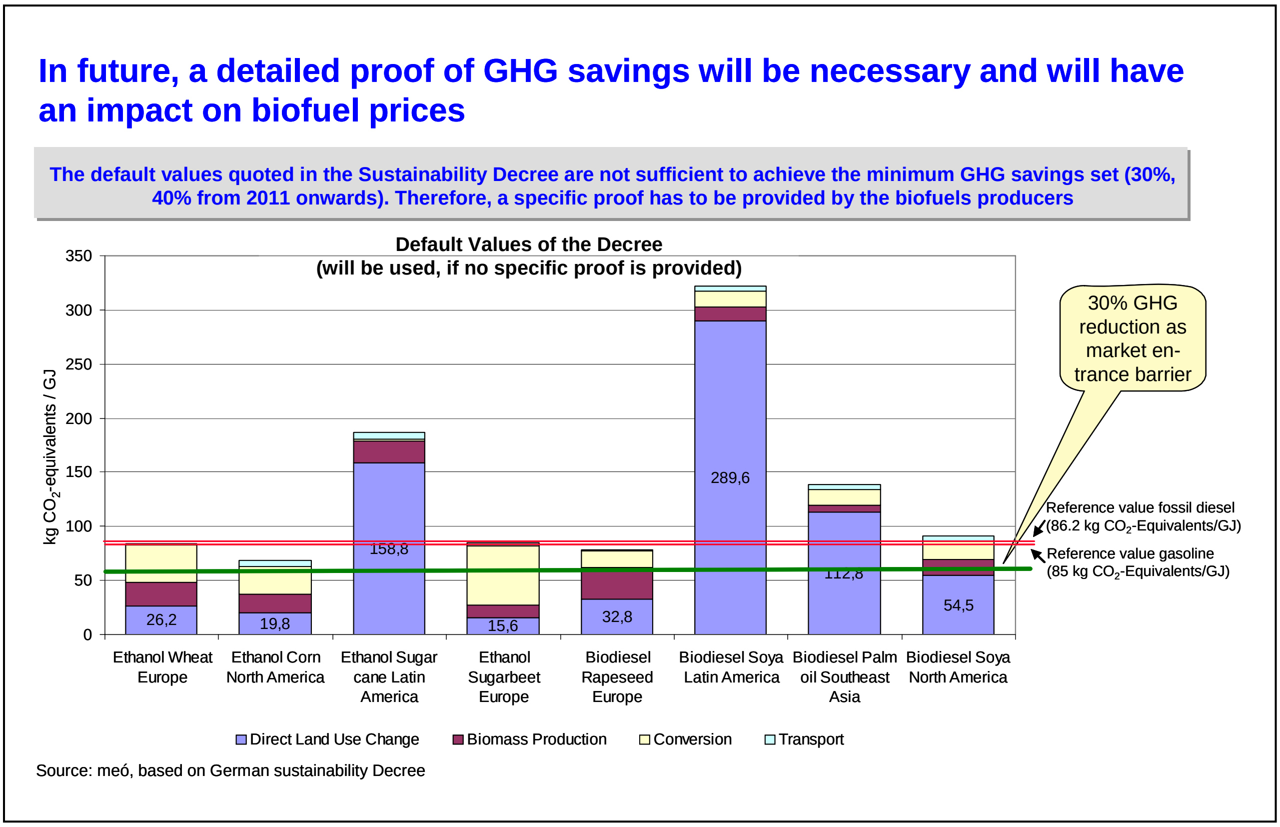

Fig. 1: Default values of the German sustainability decree including land use change.

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[1] European Parliament and Council's directive proposal supporting the use of energy from renewable resources.
Regulation requiring sustainable biomass production for biofuel purposes (Sustainable Biomass Regulation – BioNachV).

German Federal Government and European Commission's proposals include default values for achievable GHG savings for several biofuels from different feedstocks and regions (see fig. 1). However, biofuels producers have the option to let their production be certified and determine the real GHG reduction achieved by their operation. In that case, default values are not to be used anymore. This is particularly interesting for companies using special biomass and production processes that are optimized in terms of GHG/energy saving. GHG saving levels become a differentiating product characteristic and the option for individual certification incentivates innovation.

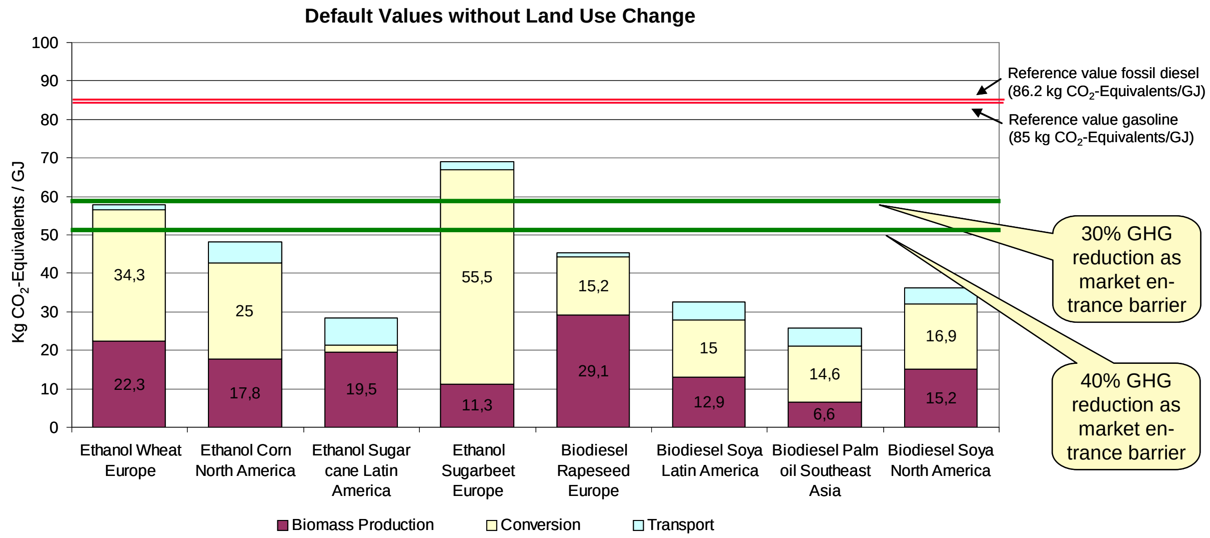
Land use change is particularly relevant regarding GHG saving. Transformation of pastures or woods into agricultural crop land leads to considerable carbon emissions, which have substantial impact on GHG balance of biofuels. On that account, critics claim that biomass production should not lead to direct or indirect land use change.

For that reason, biofuels producers should be able to prove that no land use change had occurred. If this certification does not succeed, biofuels are hardly marketable in the future.

However, if biofuels producers in South-East Asia and Latin America are able to proof by certification that their production did not cause direct land use changes, imported biofuels will have considerable advantages compared to European production (see fig. 2).

If land use change is excluded through appropriate certification, imported biofuels have a big advantage

Even without land use change European ethanol production from wheat can only reach the 30% GHG reduction baseline (based on the default values)



Source: meó, based on German Sustainability Decree

Fig. 2: Default values of the German Sustainability Decree without land use change

In future, predetermined default values for GHG savings and the option of individual GHG savings verification, with the help of sustainability certificates, will have a considerable impact on the competitiveness among biofuels. This will influence both German and European biofuels production and biofuels/feedstock international trade.

In case of a reorientation of biofuels policies towards GHG savings, it will be crucial for the mineral oil industry to be able to achieve the GHG savings at reasonable costs. The following figure (fig. 3) shows the costs from using different biofuels to reduce 1 kg GHG. It is a simplified overview only to illustrate basic impacts.

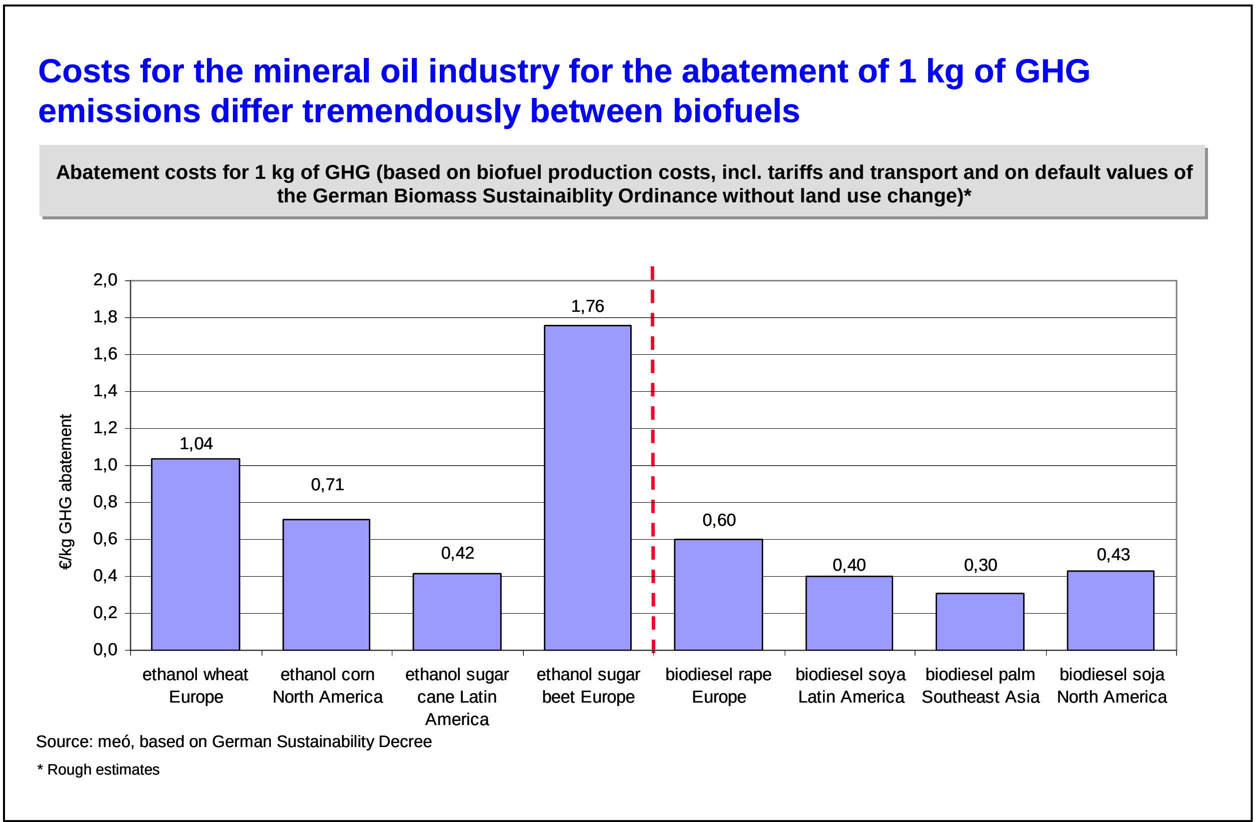


Fig. 3: Costs of GHG abatement

It is assumed that biofuels producers are able to proof by certification that no land use change had occured. On that account, the value of GHG emissions by land use changes was set to zero. Apart from that, values from the German sustainability decree were adopted. Biofuels production costs were estimated. Costs already contain transport costs and tariffs. Savings for 1 kg GHG can be calculated based on the costs of single biofuels and their respective possible GHG savings according to their default values (without land use change).

For example, according to the default values, production of biodiesel in Europe from rape causes 45.2 kg of GHG emissions per GJ while fossil diesel causes 86.2 kg of GHG emissions per GJ. This results in GHG savings of 41 kg per GJ biodiesel from rape oil. These savings can now be compared to the costs for biodiesel. In the illustration below, production costs of 0.80 €/litre of biodiesel from rape oil were assumed. Taking into account the heating value of biodiesel (32.65 MJ/litres, results in 24.50 €/GJ) reduction costs of 0.60 € for 1 kg GHG emissions can be calculated.

Fig. 3 points out clearly, that the GHG reduction costs of imported biofuels (eg. Latin American bioethanol from sugarcane, South-East Asian biodiesel from palm oil) are the lowest. As already explained, reduction of 1 kg GHG with biodiesel from rape costs 0.60 €. In contrast, using biodiesel from palm oil from South-East Asia leads to costs of 0.30 € (50% less). Moreover, GHG reduction with biodiesel from soy from Latin America only leads to costs of 0.40 € per kg of GHG and is still much more favourable than the local rape-based production.

The applied methodology for the calculation of GHG balances has essential influence on the results. Depending on the selected methodology (e.g. type of by-product allocation), results can differ considerably. In practice it may occur that for a specific production process, using two different established methodologies, GHG reduction potential can be determined to be 70% or more than 90%.

The paradigm shift in biofuels policy results in a situation where the values of particular biofuels are increasingly determined by their specific GHG balance. This generates a significant economic impact which will influence competitiveness among biofuels. Furthermore, additional costs for the mineral oil industry resulting from the GHG reduction with biofuels will increasingly determine the price range of biofuels. On that account, bioethanol from sugarcane should result in higher prices in comparison to bioethanol from wheat. Since bioethanol from sugarcane can be produced most cost-effective, it is possible that European producers can be forced out of the market by foreign producers' price competition. The competitiveness of imported biofuels is even more strengthened by the imputation of the higher GHG savings.

The aim of this new policy is to support the application of sustainable biofuels with potentially high GHG savings. For this reason, GHG reduction costs become a decisive product feature.

The existing biofuels industry in Germany and Europe might have problems to survive in the context of the new sustainability competition. On the other hand, biofuel imports from countries which are especially suited for biofuels production due to their feedstock situation and climatic condition, could rise.

However, the sustainability certification required by biofuels policies is a pre-condition for this development and becomes a de facto market access condition. Social and political acceptance of biofuels might depend on a credible certification system, able to certify efficiently and effectively the sustainable production of biomass and biofuels. Besides, it is also important to prevent that production of biomass for biofuels becomes sustainable and the non-sustainable production is merely relocated to other areas. Thus, the approach already followed to some extent, to set sustainability requirements not only for biofuels, but for all energetic uses of biomass and perspectively also for other sectors of biomass use (food, feed and biomass for industrial use) goes into the right direction.

Dr. Jan Henke / Dr. Norbert Schmitz, meó Consulting Team

meó Consulting Team
Weissenburgstr. 53
50670 Köln
info@meo-consulting.com

UNION ZUR FÖRDERUNG
VON OEL- UND PROTEINPFLANZEN E. V.
Claire-Waldoff-Straße 7 • 10117 Berlin
info@ufop.de • www.ufop.de

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